WINK: the Space Rider pathfinder for the Crystal Eye X and gamma-ray detector

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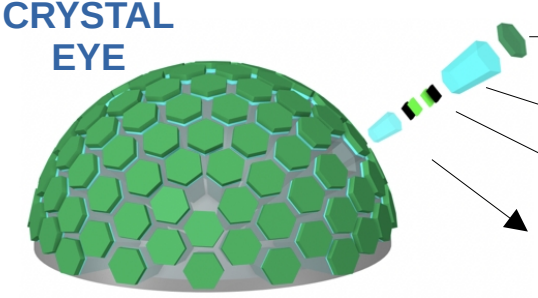
CRYSTAL EYE



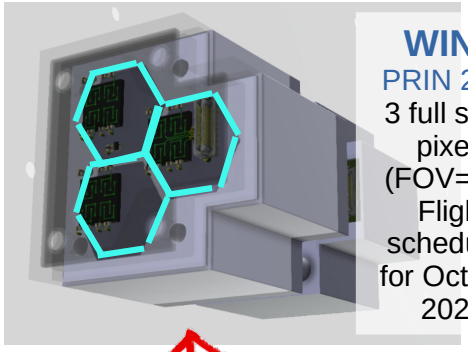
VETO charged particles

UP PIXEL: E_γ < 1 MeV

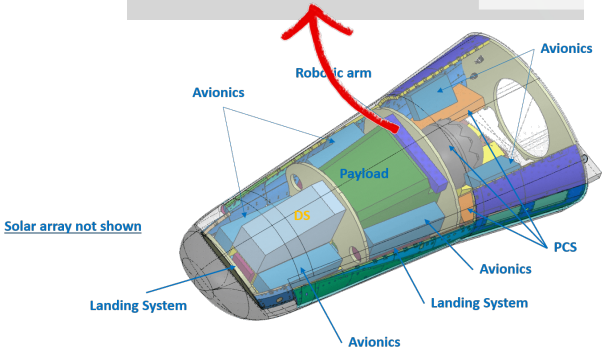
SiPM ARRAY: 4x4

DOWN PIXEL: E_γ > 1 MeV

- space based X and γ-ray future all sky monitor active from 10keV up to 30MeV, an energy range still under explored;
- 40cm diameter hemisphere made by 112 pixels made by LYSO crystals;
- wide FOV (6 sr), a good sky localization capability and a large effective area (6 times higher than Fermi-GBM @ 1MeV).



WINK
PRIN 2022
3 full scale pixels (FOV=1sr)
Flight scheduled for October 2025



SPACE OBSERVATION MODE (6 weeks)**:** exposed to deep space to characterize the cosmic background (GRB observation);
CALIBRATION MODE: 1 minute of calibration using the emission spectrum of each crystal after a relevant event or each 30 minutes;
EARTH OBSERVATION MODE (2 weeks)**:** pointing at the Earth for TGF detection.

Thanks to a breadboard model and an Engineering Model (EM), some parameters were defined and first measurements were performed:

- EPIC Crystal with polished surfaces and Enhanced Specular Reflector (ESR) will be used → highest light yield, fast response and better energy resolution;
- BC408 will be used for the anticoincidence detector;
- The DAQ electronics will be based on CITIROC-1A asic.